

# R22 Replacement

R22 – A hydroflourocarbon (HCFC). R22 is a member of a class of compounds which have been linked to ozone depletion in the earth's upper atmosphere. As a result, HCFCs ceased being used in new air conditioning equipment in the UK in 2003, in favour of non-ozone-depleting alternatives such as R410a and R407c. As from 1 January 2010, the use of virgin R22 and other HCFCs in the repair and maintenance of air conditioning and other refrigeration equipment was banned. To complicate matters further, the regulations also outlaw the stockpiling of virgin R22 for use after the deadline, so any R22 left unused at the end of 2009 should have been returned for destruction at the owner's expense. □ New legislation is already in force for the removal and replacement of this low temperature refrigerant. A ban on the production of the refrigerant came into effect from the 1st January 2010. R22 refrigerant was widely used throughout in new air conditioning and industrial refrigerant plants and these changes in legislation affect any company that has a high requirement for R22 refrigeration; over 65% of the UK's systems are assumed to still be running on R22. The refrigerant is still available in a reclaimed format until December 2014 however, demand is high due to the recent phase out and prices are expected if not already rising to extreme levels.

**So what options do you have?** □ • Do nothing! □ • Continue to operate the equipment and use recycled R22 □ • Replace the refrigerant with a 'drop in' alternative □ • Replace your equipment

## **Do Nothing!**

Regulations do not prohibit the use of R22 equipment even after the December 2014 deadline and understandably if the system is operating satisfactorily, there is no urgent need to replace an existing installation. However, depending on how crucial the system(s) are to your business, the risk of failure is increasing as the years go by and

even now spare parts are increasingly difficult to source. The risk with this strategy is however that at some point in the very near future the system operator/owner will be forced to choose between options 2, 3 or 4. It is therefore one of our objectives in assisting our clients both existing and new helping with a long term planning structure with our detailed advice and guidance with energy efficiency key to sustainability.

## **Recycled R22**

Use of recycled R22, seems to provide an easy way of extending the life of existing installations. However, a recent study by the British Refrigeration Association identified that a volume equivalent to just 10% of the amount of virgin R22 currently being used in the UK, is being returned for recycling. Due to its limited availability, recycled R22 is currently around 3 times the cost of virgin R22. Therefore, unless the situation improves radically, its poor availability and high cost means that a policy of relying on recycled R22 when the need arises is unlikely to be wise.

## **Drop in alternative**

R22 can be replaced with a few alternatives and Cool Solution have actively been testing some of our current systems with R417a (splits) and R422D (VRF / VRV). This can only be considered a short term fix since as mentioned parts will be difficult to source and an end user may end paying for initially replacing the refrigerant short term with the inevitable full replacement that in the long term costs more money than a planned replacement over several years. Issues can also relate to the energy performance of the system with higher running costs, the pressure rating of compressors, condensers and associated pipe work, leak containment, lubricant compatibility and potential conflicts with manufacturer warranties will all need to be considered.

For owners of ageing R22 air conditioning equipment with a limited useful life remaining, These complications can be overwhelming.

## Replacement of equipment

Replacement of the old R22-based air conditioning equipment with a new ozone-friendly system. At first sight, this seems to be the most expensive solution. However there are a number of factors which make this alternative increasingly the option of choice for owners, operators and maintenance contractors alike. The first reason is that as any R22-based air conditioning system is at least 6 years old and likely, therefore, to be driven by obsolete fixed-speed compressor technology. Its replacement with a modern, digital inverter-controlled system will bring significant immediate energy savings of up to 50%.

The cost and time spent replacing out-dated equipment can be reduced in some cases by retaining existing pipe work and electrical supplies. Many equipment manufacturers have introduced condensers and fan coil units specifically designed for this purpose, which can greatly simplify the installation and reduce disruption to building finishes and the activities of the occupiers.

Assuming the pipe work is replaced or found to be in good condition, a new installation will offer improved resistance to refrigerant leaks, ensuring owners can more easily satisfy their obligations under the European Fluorinated Gases (FGas) Regulations. These regulations require annual inspections to be carried out by qualified personnel, ensuring refrigerant systems are free of leaks and in full working order. A new system is also far less likely to suffer a breakdown and the associated costs of downtime and repairs, and will commonly come with the added benefit of a manufacturer-backed 3 or 5 year warranty; in some cases 8 years with Cool Solution. A little-known further benefit is that, as almost all modern air conditioning systems incorporate heat pump technology as standard, the same system that provides comfort cooling in the summer can provide clean, highly energy-efficient heating in the winter.

This option of full system replacement is compelling but three more factors which make it even more convincing. Firstly, if the installation is in a domestic property, purchased by a charity or by a range of

other not-for-profit institutions, the reduced VAT rate of 5% applies. Secondly, the Government's commitments contained in the 1997 Kyoto Protocol came into force in February 2005. The aim of radically reducing the UK's CO<sub>2</sub> emissions has led to the introduction of the Enhanced Capital Allowance Scheme ([www.eca.gov.uk](http://www.eca.gov.uk)). This Revenue & Customs-backed scheme allows any company replacing an existing air conditioning system with a more energy-efficient installation, to offset the entire cost of the project against its taxable profits in year the new system is installed. This effectively reduces the cost of the new system by an impressive 30%. It should also be remembered that a more energy-efficient system will enable building owners to achieve improved energy ratings under the recently-introduced Energy Performance of Buildings Directive. In addition, The Carbon Trust ([www.carbontrust.co.uk](http://www.carbontrust.co.uk)) offers UK businesses of all types unsecured and interest-free loans. These loans, repayable over 4 years, are designed to fund their investment in a wide range of modern, energy efficient systems such as air conditioning.